

## PATENT COOPERATION TREATY

## PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 05 OCT 2005

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Applicant's or agent's file reference ENT 7	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/SE2004/001481	International filing date (day/month/year) 15.10.2004	Priority date (day/month/year) 22.10.2003
International Patent Classification (IPC) or national classification and IPC A61F 5/58, A61F 11/04 // H04R 25/00		
Applicant Entific Medical Systems AB et al		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
  - a. ☒ (sent to the applicant and to the International Bureau) a total of 2 sheets, as follows:
    - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
    - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
  - b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) \_\_\_\_\_, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

<input checked="" type="checkbox"/>	Box No. I	Basis of the report
<input type="checkbox"/>	Box No. II	Priority
<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/>	Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/>	Box No. VI	Certain documents cited
<input type="checkbox"/>	Box No. VII	Certain defects in the international application
<input type="checkbox"/>	Box No. VIII	Certain observations on the international application

Date of submission of the demand  20.05.2005	Date of completion of this report  28.09.2005
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. +46 8 667 72 88	Authorized officer  Leif Vingård/MP Telephone No. +46 8 782 25 00

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/SE2004/001481

## Box No. I Basis of the report

1. With regard to the language, this report is based on:

- ☒ the international application in the language in which it was filed
- ☐ a translation of the international application into \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rules 12.3(a) and 23.1(b))
- ☐ publication of the international application (Rule 12.4(a))
- ☐ international preliminary examination (Rules 55.2(a) and/or 55.3(a))

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1 - 9 as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the claims:
- pages \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ as amended (together with any statement) under Article 19
- pages\* 1 - 2 received by this Authority on 20.05.2005
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the drawings:
- pages 1 - 2 as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to the sequence listing (*specify*): \_\_\_\_\_

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to the sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

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**Box No. V** Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims	<u>1-7</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-7</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-7</u>	YES
	Claims		NO

## 2. Citations and explanations (Rule 70.7)

### Cited documents:

D1) US 4498461 A  
D2) WO 03/001845 A1  
D3) WO 03/001846 A1  
D4) SE 427418 B  
D5) US 4685448 A  
D6) US 5478304 A  
D7) US 5961443 A  
D8) WO 00/02418 A1

### Explanations:

The invention refers to a hearing aid device for treating and reducing stuttering by means of auditory feedback. The hearing aid device is of the bone conducting type, i.e., it is arranged to be attached to the skull bone of a user with a stuttering problem. The ear canal is left free and the apparatus comprises a tactile component in the form of a vibrator from which the sound information is mechanically transmitted to both of the inner ears of the user via the skull bone.

Devices comprising design features of the kind mentioned above are previously known with a hearing aid apparatus anchored in the skull bone from, e.g., each of D1-D3. Furthermore, using a hearing aid apparatus arranged to be attached to the skull bone of a user for treating stuttering problems by processing the signal, e.g., by delaying or frequency-shifting the signal is, per se, previously known from each of D4-D7.

However, with the present invention the signal is so adapted

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.  
Continuation of: BOX V.

to the stuttering problematics that the person's own voice is fed back and not the surrounding sound as a stuttering person normally has no hearing problems. Thus, this processing of the sound is quite opposite to the regular use of a hearing aid, i.e., for a person with a hearing problem, in which case the surrounding sound is amplified.

The claimed processing of sound for reducing or treating stuttering is not known from any one of the cited references. Thus, the claimed invention is new. Furthermore, as the claimed invention is not obvious or close at hand to a person normally skilled in the art, it is considered to involve an inventive step. The industrial applicability of the claimed invention is obvious.

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CLAIMS

- 5 1. Device for treating and reducing stuttering by means of  
auditory feedback comprising a bone conducting hearing aid  
apparatus (1,5,6) arranged to be attached to the skull bone  
10 (3) of a user with a stuttering problem so that the ear  
canal is left free and which apparatus comprises a tactile  
component in the form of a vibrator (1) from which the  
sound information is mechanically transmitted to both of  
the inner ears of the user via the skull bone (3) c h a -  
r a c t e r i s e d i n that the signal processing of  
the hearing aid apparatus (1,5,6) is adapted to the stut-  
15 tering problematics so that the person's own voice is fed  
back and not the surrounding sound.
2. Device according to claim 1 c h a r a c t e r i s e d  
i n that the apparatus (1,5,6) comprises a skin penetra-  
20 ting member (2) and is arranged to be mechanically ancho-  
red directly into the skull bone (3) by means of osseoin-  
tegration so that the vibrations from the vibrator (1) are  
transmitted directly into the skull bone (3).
- 25 3. Device according to claim 1 c h a r a c t e r i s e d  
i n that the apparatus (1,5,6) is arranged to be mechani-  
cally anchored to the skull bone (3) via the skin so that  
the vibrations from the vibrator (1) are transmitted into  
the skull bone (3) through the skin layer.
- 30 4. Device according to claim 1 c h a r a c t e r i s e d  
i n that the frequency characteristics of the apparatus  
(1,5,6) is adjustable.
- 35 5. Device according to claim 1 c h a r a c t e r i s e d  
i n that the apparatus (1,5,6) comprises a delay circuit,  
preferably adjustable.

6. Device according to claim 1 characterised  
in that the frequency characteristics of the apparatus  
(1,5,6) is adapted to suppress surrounding sound and am-  
plify the user's own voice.

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7. Device according to claim 1 characterised  
in that the apparatus (1,5,6) comprises a microphone (5)  
of a forward-directed, directional type in order to supp-  
ress sound from other directions than the forward direc-  
tion.

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